



SON-1966

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

here the Patent Application of )

Nobuyasu KIKUCHI et al )

ATT: APPLICATION BRANCH

Application No. To be assigned )

Filed: April 27, 2001 )

For: OPTICAL PICKUP DEVICE )

PRELIMINARY AMENDMENT ACCOMPANYING FILING

Commissioner for Patents  
Washington, D.C. 20231

Sir:

Prior to the initial examination, please amend the above-identified application as follows:

IN THE ABSTRACT:

See attached sheet

REMARKS

This Preliminary Amendment is requested to amend the length of the Abstract to under 150 words. No new matter has been added.

Entry of this amendment is requested.

Respectfully submitted,

Date: May 18, 2001

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ABSTRACT OF THE DISCLOSURE

A nonvolatile semiconductor memory device having MONOS type memory cells of increased efficiency by hot electron injection and improved scaling characteristics includes a channel forming region in the vicinity of a surface of a substrate, first and second impurity regions, acting as a source and a drain in operation, formed in the vicinity of the surface of the substrate sandwiching the channel forming region between them, a gate insulating film stacked on the channel forming region and having a plurality of films, and a charge storing means that is formed in the gate insulating film dispersed in the plane facing the channel forming region. A bottom insulating film includes a dielectric film that exhibits a FN type electroconductivity and makes the energy barrier between the bottom insulating film and the substrate lower than that between silicon dioxide and silicon.

APPENDIX

## ABSTRACT OF THE DISCLOSURE

A nonvolatile semiconductor memory device [comprised of] having MONOS type memory cells of increased efficiency [of] by hot electron injection [in a write operation as well as] and improved scaling characteristics [is disclosed] includes [. The memory transistor comprises] a channel forming region in the vicinity of the surface of the substrate, a first and a second impurity regions, acting as a source and a drain in operation, formed in the vicinity of the surface of the substrate sandwiching the channel forming region [between them, acting as a source and a drain in operation, a gate insulating film stacked on the channel forming region and comprised of a plurality of films, a gate electrode provided on the gate insulating film,] and having a plurality of films, and a charge storing means [which] that is formed in the gate insulating film dispersed in the plane facing the channel forming region. [and in the direction of thickness and is injected with excited hot electrons in operation due to the electric fields applied. The] A bottom insulating film [constituting and at the bottom of the gate insulating film] includes a dielectric film that exhibits a FN type electroconductivity and makes the energy barrier between the bottom insulating film and the substrate lower than that between silicon dioxide and silicon.